IN THE CLAIMS

Please amend the claims as indicated:

1. (previously presented) An apparatus for use on a bottom hole assembly (BHA) for conveying in a borehole in an earth formation, the apparatus comprising:
   (a) an orientation sensor making measurements indicative of a toolface angle of said BHA during rotation of the BHA;
   (b) at least one directionally sensitive formation evaluation sensor for making measurements of a property of said earth formation during said continued rotation; and
   (c) a processor which estimates from said directionally sensitive measurements and said orientation sensor measurements a local spatial characteristic of said earth formation

   wherein said BHA has a non-uniform rate of rotation.

2. (previously presented) The apparatus of claim 1 wherein said local spatial characteristic comprises a dip of a bed boundary.

3. (previously presented) The apparatus of claim 1 wherein said local spatial characteristic comprises a dip of an oil-water contact.

4. (previously presented) The apparatus of claim 1 wherein said at least one

directionally sensitive formation evaluation sensor comprises two directionally sensitive formation evaluation sensors spaced apart along an axial direction of said BHA..

5. (previously presented) The apparatus of claim 1 wherein the at least one directionally sensitive formation evaluation sensor comprises a galvanic resistivity sensor.

6. (original) The apparatus of claim 5 wherein said galvanic sensor comprises a focused sensor.

7. (previously presented) The apparatus of claim 1 wherein said at least one directionally sensitive formation evaluation sensor comprises an induction sensor.

8. (original) The apparatus of claim 7 wherein said induction sensor comprises a sensor having a coil with an axis inclined to an axis of said BHA.

9. (previously presented) The apparatus of claim 1 wherein said at least one directionally sensitive formation evaluation sensor comprises a resistivity sensor having a plurality of transmitter-receiver spacings and further comprises circuitry for measuring at least one of (i) an amplitude difference, and, (ii) a phase

difference of signals measured at said plurality of spacings.

10. (original) The apparatus of claim 1 wherein said orientation sensor is associated with a first processor and said at least one resistivity sensor is associated with a second processor, said first and second processors being on a common bus.

11. (previously presented) The apparatus of claim 1 wherein said orientation sensor comprises at least one of (i) a magnetometer, (ii) an accelerometer, and, (iii) a gyrsocope.

12. **canceled**

13. (previously presented) The apparatus of claim 1 further comprising a sensor for providing a measurement indicative of an inclination and azimuth of said borehole.

14. (original) The apparatus of claim 1 wherein said processor further determines a bias in said orientation measurements.

15. **(canceled)**

16. (previously presented) The apparatus of claim 1 wherein said at least one directionally sensitive formation evaluation comprises a resistivity sensor ~~is~~ mounted on one of (i) a pad, (ii) a rib, and, (iii) a stabilizer.

17. (previously presented) The apparatus of claim 1 wherein said processor further constructs and corrects an image of said borehole.

18. (currently amended) The apparatus of claim 1 wherein ~~a processor~~ said processor further controls a drilling direction of said borehole based on said local spatial characteristic of said earth formation.

19. (currently amended) The apparatus of claim 1 wherein said processor determines said local spatial characteristic of said earth formation based on an apparent rate of penetration of the BHA.

20. (currently amended) A method of estimating a local spatial characteristic of an earth formation, the method comprising:

(a) conveying a bottom hole assembly (BHA) into a borehole in an earth formation;

(b) using an orientation sensor on said BHA for making measurements indicative of a toolface angle of said BHA during continued rotation of the

BHA;

(c) using a first directionally sensitive formation valuation sensor on said BHA for making measurements indicative of of said local spatial characteristic of said earth formation during said continued rotation; and

(d) estimating the local spatial characteristic of the earth formation ~~from~~ using said measurements of said directionally sensitive formation evaluation sensor and said orientation sensor measurements ~~said local spatial characteristic of said earth formation~~, said estimation correcting for a non-uniform rate of rotation of said BHA.

21. (previously presented) The method of claim 20 further comprising using said determined local spatial characteristic for controlling a drilling direction of said borehole.

22. (previously presented) The method of claim 20 wherein said local spatial characteristic comprises a apparent dip angle between an axis of said borehole and a bed boundary in said earth formation.

23. (currently amended) The method of claim 20 wherein determining said ~~dip~~ local characteristic further comprises using measurements from a second directionally sensitive formation evaluation sensor spaced apart axially from said

first directionally sensitive formation evaluation sensor.

24. (previously presented) The method of claim 20 wherein the first directionally sensitive formation evaluation sensor comprises a galvanic sensor.

25. (original) The method of claim 24 wherein said galvanic sensor comprises a focused sensor.

26. (previously presented) The method of claim 20 wherein saidfirst directionally sensitive formation evaluation sensor comprises an induction sensor.

27. (previously presented) The method of claim 26 wherein said induction sensor comprises a sensor having a coil with an axis inclined to an axis of said BHA.

28. (currently amended) The method of claim 20 wherein said first directionally sensitive formation evaluation sensor comprises a resistivity sensor with a plurality of transmitter-receiver spacings, and using said resistivity sensor further comprises ~~a making~~ making measurements of at least one of (i) and amplitude difference, and, (ii) a phase difference of signals measured at said plurality of spacings.

29. (previously presented) The method of claim 20 further comprising coupling a first processor associated with said orientation sensor and a second processor associated with the first directionally sensitive formation evaluation sensor to a common bus.

30. (previously presented) The method of claim 20 wherein said orientation sensor is selected from the group consisting of: (i) a magnetometer, (ii) an accelerometer, and, (iii) a gyroscope..

31. **canceled**

32. (previously presented) The method of claim 20 further comprising using an additional sensor for providing a measurement indicative of an inclination and azimuth of said borehole.

33. (original) The method of claim 20 further comprising determining a bias in said orientation measurements.

34. **canceled**

35. (previously presented) The method claim 20 wherein said first directionally

sensitive formation evaluation sensor is mounted on one of (i) a pad, (ii) a rib, and, (iii) a stabilizer.

36. (original) The method of claim 20 further comprising obtaining an image of said borehole.

37. (original) The method of claim 36 further comprising correcting said image.

38. (original) The method of claim 36 further comprising identifying tool face angles associated with a sticking of the BHA.

39. (previously presented) The apparatus of claim 1 wherein said directionally sensitive formation evaluation sensor is selected from the group consisiting of (i) a resistivity sensor, and, (ii) a nuclear sensor.

40. (previously presented) The apparatus of claim 1 wherein said local spatial characteristic of said earth formation is selected from the group consisting of (i) a dip of an interface in said earth formation, and, (ii) an image of a wall of said borehole.

41. (previously presented) The apparatus of claim 4 further comprising a processor

for determining from measurements made by said two directionally sensitive formation evaluation sensors a rate of penetration of said BHA.

42. (previously presented) The apparatus of claim 13 wherein said sensor for providing a measurement indicative of an inclination and azimuth of said borehole comprises a gyroscope.

43. (previously presented) The method of claim 20 wherein said directionally sensitive formation evaluation sensor is selected from the group consisiting of (i) a resistivity sensor, and, (ii) a nuclear sensor.

44. (previously presented) The apparatus of claim 20 wherein said local spatial characteristic of said earth formation is selected from the group consisting of (i) a dip of an interface in said earth formation, and, (ii) an image of a wall of said borehole.

45. canceled

46. (currently amended) The method of ~~claim~~ claim 20 further comprising altering a direction of drilling of said BHA based at least in part on said estimated local spatial characteristic of said earth formation.

IN THE CLAIMS

Please amend the claims as indicated:

1. (previously presented) An apparatus for use on a bottom hole assembly (BHA) for conveying in a borehole in an earth formation, the apparatus comprising:
   (a) an orientation sensor making measurements indicative of a toolface angle of said BHA during rotation of the BHA;
   (b) at least one directionally sensitive formation evaluation sensor for making measurements of a property of said earth formation during said continued rotation; and
   (c) a processor which estimates from said directionally sensitive measurements and said orientation sensor measurements a local spatial characteristic of said earth formation

   wherein said BHA has a non-uniform rate of rotation.

2. (previously presented) The apparatus of claim 1 wherein said local spatial characteristic comprises a dip of a bed boundary.

3. (previously presented) The apparatus of claim 1 wherein said local spatial characteristic comprises a dip of an oil-water contact.

4. (previously presented) The apparatus of claim 1 wherein said at least one

directionally sensitive formation evaluation sensor comprises two directionally sensitive formation evaluation sensors spaced apart along an axial direction of said BHA..

5. (previously presented) The apparatus of claim 1 wherein the at least one directionally sensitive formation evaluation sensor comprises a galvanic resistivity sensor.

6. (original) The apparatus of claim 5 wherein said galvanic sensor comprises a focused sensor.

7. (previously presented) The apparatus of claim 1 wherein said at least one directionally sensitive formation evaluation sensor comprises an induction sensor.

8. (original) The apparatus of claim 7 wherein said induction sensor comprises a sensor having a coil with an axis inclined to an axis of said BHA.

9. (previously presented) The apparatus of claim 1 wherein said at least one directionally sensitive formation evaluation sensor comprises a resistivity sensor having a plurality of transmitter-receiver spacings and further comprises circuitry for measuring at least one of (i) an amplitude difference, and, (ii) a phase

difference of signals measured at said plurality of spacings.

10. (original) The apparatus of claim 1 wherein said orientation sensor is associated with a first processor and said at least one resistivity sensor is associated with a second processor, said first and second processors being on a common bus.

11. (previously presented) The apparatus of claim 1 wherein said orientation sensor comprises at least one of (i) a magnetometer, (ii) an accelerometer, and, (iii) a gyrsocope.

12. **canceled**

13. (previously presented) The apparatus of claim 1 further comprising a sensor for providing a measurement indicative of an inclination and azimuth of said borehole.

14. (original) The apparatus of claim 1 wherein said processor further determines a bias in said orientation measurements.

15. **(canceled)**

16. (previously presented) The apparatus of claim 1 wherein said at least one directionally sensitive formation evaluation comprises a resistivity sensor ~~is~~ mounted on one of (i) a pad, (ii) a rib, and, (iii) a stabilizer.

17. (previously presented) The apparatus of claim 1 wherein said processor further constructs and corrects an image of said borehole.

18. (currently amended) The apparatus of claim 1 wherein ~~a processor~~ said processor further controls a drilling direction of said borehole based on said local spatial characteristic of said earth formation.

19. (currently amended) The apparatus of claim 1 wherein said processor determines said local spatial characteristic of said earth formation based on an apparent rate of penetration of the BHA.

20. (currently amended) A method of estimating a local spatial characteristic of an earth formation, the method comprising:

(a) conveying a bottom hole assembly (BHA) into a borehole in an earth formation;

(b) using an orientation sensor on said BHA for making measurements indicative of a toolface angle of said BHA during continued rotation of the

BHA;

(c) using a first directionally sensitive formation valuation sensor on said BHA for making measurements indicative of of said local spatial characteristic of said earth formation during said continued rotation; and

(d) estimating the local spatial characteristic of the earth formation ~~from~~ using said measurements of said directionally sensitive formation evaluation sensor and said orientation sensor measurements ~~said local spatial characteristic of said earth formation~~, said estimation correcting for a non-uniform rate of rotation of said BHA.

21. (previously presented) The method of claim 20 further comprising using said determined local spatial characteristic for controlling a drilling direction of said borehole.

22. (previously presented) The method of claim 20 wherein said local spatial characteristic comprises a apparent dip angle between an axis of said borehole and a bed boundary in said earth formation.

23. (currently amended) The method of claim 20 wherein determining said ~~dip~~ local characteristic further comprises using measurements from a second directionally sensitive formation evaluation sensor spaced apart axially from said

first directionally sensitive formation evaluation sensor.

24. (previously presented) The method of claim 20 wherein the first directionally sensitive formation evaluation sensor comprises a galvanic sensor.

25. (original) The method of claim 24 wherein said galvanic sensor comprises a focused sensor.

26. (previously presented) The method of claim 20 wherein saidfirst directionally sensitive formation evaluation sensor comprises an induction sensor.

27. (previously presented) The method of claim 26 wherein said induction sensor comprises a sensor having a coil with an axis inclined to an axis of said BHA.

28. (currently amended) The method of claim 20 wherein said first directionally sensitive formation evaluation sensor comprises a resistivity sensor with a plurality of transmitter-receiver spacings, and using said resistivity sensor further comprises ~~a making~~ making measurements of at least one of (i) and amplitude difference, and, (ii) a phase difference of signals measured at said plurality of spacings.

29. (previously presented) The method of claim 20 further comprising coupling a first processor associated with said orientation sensor and a second processor associated with the first directionally sensitive formation evaluation sensor to a common bus.

30. (previously presented) The method of claim 20 wherein said orientation sensor is selected from the group consisting of: (i) a magnetometer, (ii) an accelerometer, and, (iii) a gyroscope..

31. **canceled**

32. (previously presented) The method of claim 20 further comprising using an additional sensor for providing a measurement indicative of an inclination and azimuth of said borehole.

33. (original) The method of claim 20 further comprising determining a bias in said orientation measurements.

34. **canceled**

35. (previously presented) The method claim 20 wherein said first directionally

sensitive formation evaluation sensor is mounted on one of (i) a pad, (ii) a rib, and, (iii) a stabilizer.

36. (original) The method of claim 20 further comprising obtaining an image of said borehole.

37. (original) The method of claim 36 further comprising correcting said image.

38. (original) The method of claim 36 further comprising identifying tool face angles associated with a sticking of the BHA.

39. (previously presented) The apparatus of claim 1 wherein said directionally sensitive formation evaluation sensor is selected from the group consisiting of (i) a resistivity sensor, and, (ii) a nuclear sensor.

40. (previously presented) The apparatus of claim 1 wherein said local spatial characteristic of said earth formation is selected from the group consisting of (i) a dip of an interface in said earth formation, and, (ii) an image of a wall of said borehole.

41. (previously presented) The apparatus of claim 4 further comprising a processor

for determining from measurements made by said two directionally sensitive formation evaluation sensors a rate of penetration of said BHA.

42. (previously presented) The apparatus of claim 13 wherein said sensor for providing a measurement indicative of an inclination and azimuth of said borehole comprises a gyroscope.

43. (previously presented) The method of claim 20 wherein said directionally sensitive formation evaluation sensor is selected from the group consisiting of (i) a resistivity sensor, and, (ii) a nuclear sensor.

44. (previously presented) The apparatus of claim 20 wherein said local spatial characteristic of said earth formation is selected from the group consisting of (i) a dip of an interface in said earth formation, and, (ii) an image of a wall of said borehole.

45. canceled

46. (currently amended) The method of ~~claim~~ <u>claim 20</u> further comprising altering a direction of drilling of said BHA based at least in part on said estimated local spatial characteristic of said earth formation.